

IN THE DRAWINGS

The attached sheet of drawings includes changes to Figs. 2, 5, 7, 8 and 9. The sheets, which include Figs. 2, 5, 7, 8 and 9, replaces the original sheets including Figs. 2, 5, 7, 8 and 9.

Attachment: Replacement Sheets

REMARKS/ARGUMENTS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-43 are pending in the present application and Claims 1-35, 37-41 and 43 are amended. Support for the foregoing amendments can be found in the claims as originally filed. Thus, no new matter is added.

In the outstanding Office Action, the Drawings are objected to under 37 CFR §1.84(1) as having shaded grey areas; Claims 6, 12-14, 16 and 40 are rejected under 35 U.S.C. §112, second paragraph, as indefinite; Claims 1-7, 23, 32, 42 and 43 are rejected under 35 U.S.C. § 103(a) as unpatentable over Delerue et al. (EP 0961523 A1, herein "Delerue") in view of O'Connell (U.S. Pat. No. 5,331,111) and Mitsuhashi et al. (U.S. Pat. No. 5,127,306, herein "Mitsuhashi"); Claims 8 and 9 are rejected under 35 U.S.C. § 103(a) as unpatentable over Delerue, O'Connell, Mitsuhashi in view of MusicSpace application (Copyright 1998, herein "MusicSpace"); Claims 10, 14-18, 26, 31, 33, 26-38 and 40 are rejected under 35 U.S.C. § 103(a) as unpatentable over Delerue, O'Connell, Mitsuhashi in view of Lydecker et al. (U.S. Pat. App. No. 2003/0028273, herein "Lydecker"); Claims 11-13 are rejected under 35 U.S.C. § 103(a) as unpatentable over Delerue, O'Connell, Mitsuhashi in view of Tsuji et al. (WO 99/50466, herein "Tsuji"); Claims 19, 20, 22 are rejected under 35 U.S.C. § 103(a) as unpatentable over Delerue, O'Connell, Mitsuhashi in view of Bargen, B. et al. ("Inside DirectX", Microsoft Press, Redmond, WA, 1998., pages 3-9, 26-29, 203-205, 223-233, 241-247, 249-266, herein "Bargen"); Claim 21 is rejected under 35 U.S.C. § 103(a) as unpatentable over Delerue, O'Connell, Mitsuhashi in view of Beard et al. (U.S. Pat. No. 5,451,942, herein "Beard"); Claims 24, 25, 39 and 41 are rejected under 35 U.S.C. § 103(a) as unpatentable over Delerue, O'Connell, Mitsuhashi in view of Lydecker and Beard; and

Claims 27-30, 34 and 35 U.S.C. § 103(a) as unpatentable over Delerue, O'Connell, Mitsuhashi in view of Lydecker and Bargen.

In response to the objection to the drawings as having grey shaded areas, Figs. 2, 5 and 7-9 have been corrected to more clearly show the features depicted in the figures. Accordingly, Applicants respectfully request that the objection to the drawings under 37 CFR §1.84(1) be withdrawn.

In response to the rejection under 35 U.S.C. § 112, second paragraph, of Claims 6, 12-14, 16 and 40, Applicants have amended Claims 6, 12-14, 16 and 40. Specifically, the examples following and the phrase “e.g.,” in Claims 6 and 16, have been removed. Additionally, the phrases inside the parenthesis in Claims 12-14 have been removed and the example following and the phrase “such as,” in Claim 40, has been removed. Accordingly, Applicants respectfully request that the rejection of Claims 6, 12-14, 16 and 40 under 35 U.S.C. § 112, second paragraph be withdrawn.

Before turning to the outstanding prior art rejections, it is believed that a brief review of the present invention would be helpful.

The present invention describes a system for controlling an audio spatialisation in real time. In a non-limiting example, shown in Figure 1, the system includes a storage unit that stores audio streams composed of a plurality of audio sources associated to audio tracks.¹ A constraint solver that receives and processes constraints expressing rules for a spatialisation of said audio stream.² An interface used to enter spatialisation commands to the constraint solver.³ Figure 4 shows a non-limiting example of the interface.

The exemplary interface allows users to decide where audio sources will be located with respect to user. Additionally, the interface allows the user to effect a grouped

¹ Figure 1.

² Specification, Page 1, first paragraph.

³ Figure 4.

spatialisation command in which the spatialisation command works on a group of audio sources. This group of audio sources is then processed in the constraint solver as a unitary object for the application of constraint variables. Further, the user can displace one or a number of presented groups of audio sources through collective commands.

Turning now to the §103(a) rejection of independent Claim 1 in the outstanding Office Action, Applicants respectfully traverse the §103(a) rejection based on Delerue, O'Connell, and Mitsuhashi for the following reasons.

Claim 1 recites, in part,

interface means for entering spatialising commands to said constraint means,
wherein said interface means presents at least one user input for effecting a grouped spatialisation command, said command acting on a specified group of audio sources, and
said constraint means is programmed to process said group of audio sources as a unitary object for the application of said constraint variables.

Independent Claim 43 recites similar features.

Delerue describes a music spatialisation system and method. Further, Delerue describes a user input for affecting a single spatialisation command, where the user can only move one sound source at a time through the graphical interface.⁴ An algorithm is used to adapt the variables for the other sounds sources based on constraints. Thus the algorithm sets the position for the other sound sources.⁵ As a result, perturbations from one sound source are propagated onto the next sound source. Thus, a previously calculated sound source variable is not perturbed again during the rest of the algorithm and a sound source variable calculated by the algorithm does not undergo the same evolution as that of a sounds source directly mobbed by the user through the interface.⁶

⁴ Delerue, paragraphs 0033 and 0034.

⁵ Delerue, paragraphs 0033 and 0034.

⁶ Specification, page 4, lines 18-26.

O'Connell describes a sound model generator with a graphical programming engine. In O'Connell, icons relate to different sound treatments⁷ and icon locations are defined to obtain a more convenient display.⁸ Further, each icon has a signal entry, provides a given signal treatment, and provides an output signal based on this treatments. Thus, O'Connell describes that icons can be merged to facilitate motion of the icon on a graphical display for clarity reasons.

However, O'Connell does not deal with spatialisation processing. In O'Connell, the location of the icons on the graphical display has no influence on the audio signals. Thus, moving a merged icon would also have no influence on the audio signals. O'Connell merely allows icon movement and placement for convenience purposes. Only the connections between the icons define the overall sounds treatment algorithm. Thus, the only way of modifying the influence of a sound treatment on an entering sound signal is to change the connections between the sound treatment icons. Once icons are merged if the connections are unchanged then the sounds treatments are also unchanged.

Moreover, in O'Connell icons relate to sound treatments not sound sources. The spatial location of the sound sources is not dealt with in O'Connell. Each icon has a signal entry, provides a signal treatment, and provides an output signal based on this treatment. The respective positions of icons associated with the sound treatments have no influence on the sound generation algorithm since location is not a criterion for the signal treatment applied.

Thus, since the incidence of any icon motion on the sound rendering is not described or suggested by O'Connell, the merging of icons to facilitate motion for clarity can not be combined with Delerue to produce "user input for affecting a grouped spatialisation command, said command acting on a specified group of audio sources." Neither Delerue or

⁷ O'Connell, Figs. 24-28.

⁸ O'Connell, Col. 50.

O'Connell describe a spatialisation command acting on a group, a feature that requires that spatialisation sound processing problems be overcome.

Thus, starting from Delerue, one cannot use O'Connell to derive a grouped spatialisation command that can overcome spatialisation sound processing problems.

Moreover, the combination of Delerue and Mitsuhashi does not lead to the claimed invention either. Indeed, Mitsuhashi does not deal with a spatialisation system. In other words, Mitsuhashi does not describe a graphical interface for moving sound sources in order to modify spatialisation. Further, spatialisation commands are not dealt with at all in Mitsuhashi. Instead, Mitsuhashi applies to a single instrument generating the different sound sources as if they all originated from a same undefined space point.

Accordingly Mitsuhashi only provides a system for selectively grouping different sound sources and for modifying sound treatments applied on the sound sources belonging to a given group.

Thus, Applicants respectfully submit that independent Claim 1 and similarly Claim 43 patentably distinguish over Delerue, O'Connell, and Mitsuhashi considered alone or together in any proper combination.


Consequently, in light of the above discussion and in view of the present amendment, the present application is believed to be in condition for allowance and an early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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